CLAIMS

What is claimed is:

1. A method for operating a channel coder, comprising steps of:

maintaining a first count (N_Number) of transmitted packets and a second count (K_Number) of packets that are erroneously decoded at a receiver;

periodically performing a plurality of statistical tests using current values of the first and second counts; and

based on a result of said statistical tests, controlling said channel coder to either maintain a current channel coding technique or to switch to another channel coding technique.

2. A method as in claim 1, wherein said step of controlling is comprised of a further step of resetting said first count and said second count.

3. A method as in claim 1, wherein the step of periodically performing a plurality of statistical tests is comprised of steps:

at a crossing point where a first channel coding algorithm (CS-1) and a second channel coding algorithm (CS-2) provide a same net bit rate, assuming as a first hypothesis that a packet error rate (PER) is greater than a PER of CS-1, P1, if CS-1 is currently being used, or assuming as the first hypothesis that the PER is less than a PER of CS-2, P2, if CS-2 is currently being used;

assuming as reference case that N_Number of packets have been transmitted with a constant PER equal to either P1 or P2, depending on the currently used channel coding algorithm CS-1 or CS-2;

determining a first probability (P-value) using said first count and said second count and the constant PER P1 or P2, depending on the currently used channel coding algorithm CS-1 or CS-2;

comparing P-value to a risk level (RL) for determining whether the first hypothesis can be rejected; and

only if the first hypothesis is rejected, changing to the other channel coding algorithm and resetting N_Number and K_Number;

assuming as a second hypothesis that PER is less than the PER of CS-1, P1, if CS-1 is currently being used, or assuming as the second hypothesis that PER is greater than the PER of CS-2, P2, if CS-2 is currently being used;

assuming the same reference case that N_Number of packets have been transmitted with a constant PER equal to either P1 or P2, depending on the currently used channel coding algorithm CS-1 or CS-2;

determining a second probability (P-value) using said first count and said second count and the constant PER P1 or P2, depending on the currently used channel coding algorithm CS-1 or CS-2;

comparing P-value to RL for determining whether the second hypothesis can be rejected; and

only if the second hypothesis is rejected, resetting N_Number and K_Number without changing to the other channel coding algorithm.

4. A method as in claim 1, wherein the step of periodically performing a plurality of statistical tests comprises steps of:

accessing at least one look-up table using the current values of the first and second counts to retrieve a probability value (P-value); and

comparing the retrieved P-value to a threshold to determine whether an assumed hypothesis should be accepted or rejected.

5. A method for operating a channel coder to operate with a first channel coding algorithm (CS-1) or a second channel coding algorithm (CS-2), comprising steps of:

maintaining a first count (N_Number) of transmitted packets and a second count (K_Number) of packets that are erroneously decoded at a receiver;

periodically performing a plurality of statistical tests in accordance with the steps of, if a current channel coding is CS-1:

determining if a change should be made to CS-2 by assuming as a hypothesis that: PER > P1;

assuming as a reference case that N_Number of packets have been transmitted with a constant PER value of P1;

determining a probability (P-value) in accordance with:

$$P\text{-}value = \sum_{i=0}^{K\_Number} \binom{N\_Number}{i} P1^{i}(1-P1)^{N\_Number-i}$$

if P-value is less than a risk level (RL), rejecting the hypothesis with (1-RL) confidence;

if the hypothesis is rejected, changing to CS-2, and resetting N_Number and K_Number, else if the hypothesis is accepted, continuing to average channel readings; and then

confirming CS-1 by

assuming as a hypothesis that: PER < P1;

assuming the same reference case;

determining the probability (P-value) in accordance with:

$$P\text{-}value = \sum_{i=K\_Number}^{N\_Number} \binom{N\_Number}{i} P1^{i}(1-P1)^{N\_Number-i}$$

if P-value is less than RL, rejecting the hypothesis with (1-RL) confidence;

if the hypothesis is rejected, resetting N_Number and K_Number, else if the hypothesis is accepted, continuing to average channel readings;

else if the current channel coding is CS-2:

determining if a change should be made to CS-1 by assuming as a hypothesis that: PER < P2;

assuming the same reference case;

determining the probability (P-value) in accordance with:

$$P\text{-}value = \sum_{i=K\_Number}^{N\_Number} \binom{N\_Number}{i} P2^{i} (1-P2)^{N\_Number-i}$$

if P-value is less than RL, rejecting the hypothesis with (1-RL) confidence;

if the hypothesis is rejected, changing to CS-1, and resetting N_Number and K_Number, else if the hypothesis is accepted, continuing to average channel readings; and then

confirming CS-2 by

assuming as a hypothesis that: PER > P2;

assuming the same reference case;

determining the probability (P-value) in accordance with:

$$P\text{-}value = \sum_{i=0}^{K\_Number} \binom{N\_Number}{i} P2^{i} (1-P2)^{N\_Number-i}$$

if P-value is less than RL, rejecting the hypothesis with (1-RL) confidence;

if the hypothesis is rejected, resetting N_Number and K_Number, else if the hypothesis is accepted, continuing to average channel readings.

6. A method as in claim 5, wherein the steps of determining the P-value comprise an initial step of pre-computing P-values for a range of values of N_Number and K_Number and P1 and P2 values; storing the pre-computed

values in at least one look-up table; and accessing the look-up table with current values of N_Number and K_Number to retrieve a corresponding P-value.

7. A method for operating a channel coder, comprising steps of:

while operating with a first channel coding technique, updating a first count (N_Number) of transmitted packets and a second count (K_Number) of packets that are erroneously decoded at a receiver; and

periodically performing a plurality of statistical tests using current values of the first and second counts, wherein the step of periodically performing the plurality of statistical tests is comprised of sub-steps of,

determining if a first hypothesis is rejected, and if yes, switching to a second channel coding technique, and resetting the first and second counts, before continuing the step of averaging; while if the first hypothesis is accepted,
determining if a second hypothesis is rejected, and if yes, resetting the first and second counts, before continuing the step of averaging; while if the second hypothesis is also accepted,
continuing the step of averaging without first resetting the first and second counts.